About the ATSC

- Standards Development Organization for Digital Television
    - Founded in 1983 by CEA, IEEE, NAB, NCTA, and SMPTE
    - Focused on terrestrial digital television broadcasting
    - ATSC is an open, due process organization.
    - Approximately 160 Member Organizations

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Project Approval & Assignment

Board Ad-Hoc Develops Requirements

Planning Teams Develop Requirements

NWIP*

Other Interested Parties Develop Requirements

Board Approves Project Assigns work to TSG

TSG Assigns Work to Specialist Group

*New Work Item Proposal
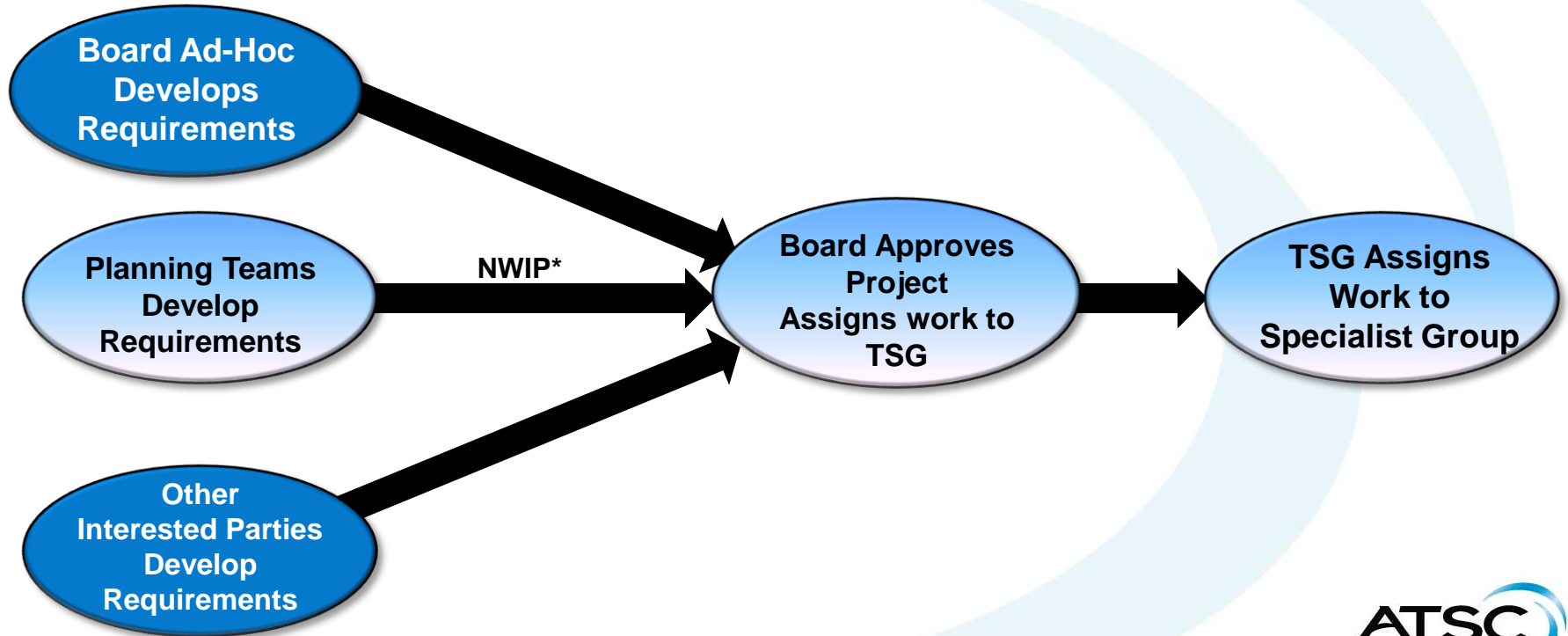
Development And Approval

Specialist Group Develops Specification
"consensus" or vote by "2/3 rule"

Technology Group Elevates to Proposed Standard
2/3 majority approval, comments are considered

Membership Approval
2/3 majority approval, comments are considered

Working Draft

Proposed Standard

Standard

Technology Group Elevates to Candidate Standard for a Set Period
reverts back to Working Draft if not elevated to Proposed Standard or the CS period extended

Candidate Standard

Technology Group Elevates to Proposed Standard
2/3 majority approval, comments are considered
Specialist Group Revises Document as Necessary

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ATSC Patent Policy

• The goal of the policy is to encourage companies to license essential claims on a reasonable, non-discriminatory basis.

• The policy requires participants to disclose essential claims known to be in a Specification document.

• A license to the Essential Claim will be made available upon request for the purpose of implementing the Specification Document

- • Without compensation to all applicants
  - **or**
- • Under reasonable and nondiscriminatory terms and conditions to all applications

The Patent Policy and related Patent Statements are available at www.atsc.org

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ATSC DTV Standard (A/53)

Coding

- Video: MPEG-2 (HDTV & SDTV)
- Audio: AC-3 (5.1 Channel)

A/72 specifies use of AVC/MPEG4 Coding

Transport Layer

- MPEG-2

A/65 specifies PSIP
A/90 specified data broadcast specifcations
A/70 specifies conditional access

Transmission

- Vestigial Sideband (VSB)
- 19.4 M/bits per second in 6MHz Channels

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Evolution: Mobile DTV (A/153)

Standard for delivery of real-time and non-real-time television content to mobile and handheld devices

- ATSC Mobile DTV is backwards-compatible
  - Mobile DTV services are carried in existing DTV broadcast channels along with existing services such as high-definition programming
  - No adverse impact on legacy receiving equipment
  - Additional spectrum is not needed to offer mobile services

Mobile DTV

- Robust
- AVC
- IP Transport
- HE AAC

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ATSC Mobile DTV Standard

Presentation Layer

--MPEG-4 AVC (ITU-R H.264) video coding

--HE AAC v2 audio coding

--Closed captioning

Management Layer (Transport – Internet Protocol)

--Streaming and non-real-time file transfer
--Electronic Service Guide, based on OMA BCAST

Physical Layer (Transmission)

--Vestigial Sideband (VSB)

--19.4 M/bits per second in 6MHz Channels

--RF transmission and forward error correction, compatibility with legacy 8-VSB receivers/decoders

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Evolution: 3DTV

3DTV

- 3D program dependent on 2D program
  - 2D is left eye
  - Additional information for right eye
- 3D program independent of 2D
- Mobile 3D
  - Handheld devices without special glasses
- Non-real-time file delivery of 3DTV

- Standard for terrestrial broadcast of 3DTV
- Multimode (Profiles)

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Evolution: Non-Real Time (NRT)

- Non-Real Time – content delivered in advance of use and stored for later consumption
  - Most broadcast programming does not need to be delivered in real-time!
    - File based delivery
  - Addresses the growing desire for "everything on demand"
  - Storage cost reduction/increased capacity and advanced compression technologies are driving forces that make NRT practical

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Evolution: Non-Real Time (NRT)

- Various service scenarios have been identified as the basis for NRT technical requirements
  - News, weather, traffic, and sports clips
  - Long-form entertainment programming download
  - Program previews coupled with electronic guide
  - Telescoping ads
  - Targeted advertising

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Evolution: ATSC 2.0

ATSC 2.0

• Advanced Video Compression
• Non-real-time
• Conditional Access
• Digital rights management
• Advanced EPG
• Audience measurement

- **ATSC 2.0** will be a complete suite of new services for the conventional fixed DTV receiver
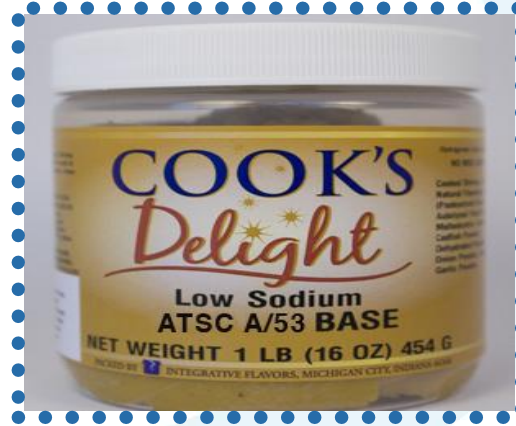
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A Good Strong Base

- **ATSC DTV Standard - A/53**
- **HDTV and Multicasting**

A Dash of A/52 Audio and PSIP Seasoning

- A/52 Audio
- **P**epper
- **S**alt
- **I**talian Seasonings
- **P**aprika

A Smidge of A/72

- **Advanced Video Compression**
- "A Little Goes A Long Way…"

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Data Broadcasting

- **Versatile Data Broadcasting Ingredients**
- **Use it in anything!**

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NRT for Flavor

- **N**utmeg
- **R**osemary
- **T**hyme

= Non-Real-Time Ingredients

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Conditional Access

"Some Like It Hot!"

Interactivity and Personalization

Internet Connectivity

ATSC 2.0

- A/53 Base
- PSIP
- A/72 AVC
- Data Broadcasting
- Non Real-time
- Conditional Access
- Interactivity
- Internet Connectivity

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ATSC 3.0

- As a Standards Development Organization, it's part of our mission to plan for the future

- ATSC 3.0 is a concept for Strategic Planning
  - The initial analysis is underway in Planning Team 1
  - Standards development has not started
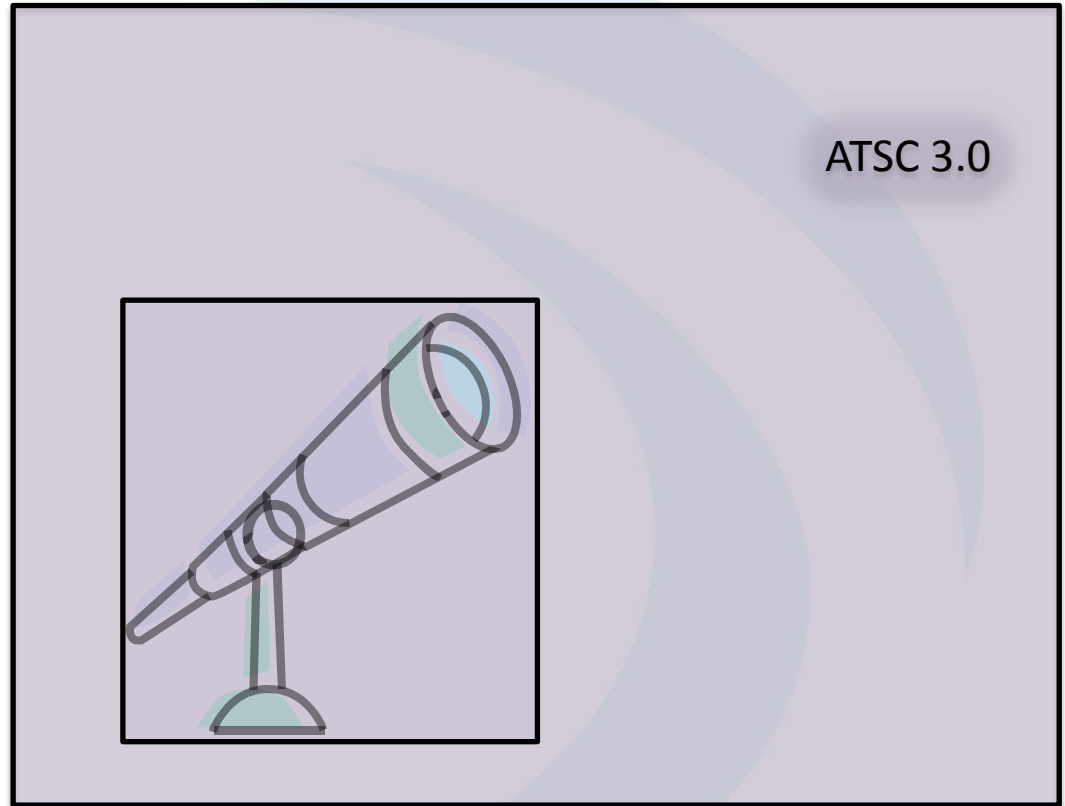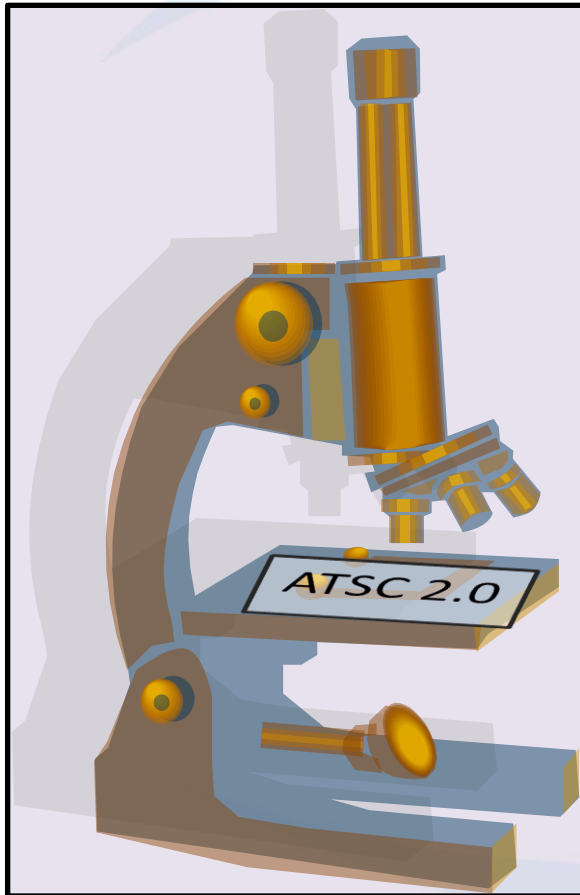   - Technology decisions have not been made

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ATSC 3.0

ATSC 3.0

- Configurable
- Scalable
- Efficient
- Interoperable
- Adaptable

- Next Generation Broadcast Television
  - 3.0 must provide performance improvement and additional functionality significant enough to warrant implementation of a non-backwards compatible system
  - Timeframe: 10 years
    - Factors that can affect timeframe
    - Regulatory (Spectrum)
    - Technology
    - Business

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Perspective

ATSC 2.0

ATSC 3.0

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